

**ABSTRACT OF THE DISCLOSURE**

A primary heat exchanger of a condensing furnace or a single heat exchanger of a mid-efficiency furnace is electrochemically coated with a coating of copper metal. The copper coating is oxidized with an aqueous oxidizing alkaline solution to form a matte black layer of cupric oxide. As the layer of cupric oxide is black, the layer has a high emissivity and emits more heat, increasing the efficiency of the primary heat exchanger. Alternatively, iron can be electrochemically coated on the primary heat exchanger and oxidized to black magnetite to increase emissivity.

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